

**INCLUDING CAPITAL EXPENSES
IN THE PROSPECTIVE PAYMENT SYSTEM**

The Congress of the United States
Congressional Budget Office



NOTES

Unless otherwise indicated, all years referred to in the text are fiscal years.

Details in the text and tables of this report may not add to totals because of rounding.

The cover photographs were provided by the University of Minnesota Health Sciences Center.

PREFACE

At the time the Congress established the prospective payment system (PPS) for inpatient hospital service, payments for capital-related expenses were not included in the new system. This study was conducted by the Congressional Budget Office (CBO) in response to a request by the Subcommittee on Health and the Environment of the Committee on Energy and Commerce, made soon after passage of the PPS legislation. The report examines the advantages and disadvantages of prospective payment for capital costs, the effects of such a change on the financial condition of hospitals, and the impacts of various policies that would provide a transition to a prospective system.

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Many others contributed to the study. Staff at the Prospective Payment Assessment Commission--in particular, Bruce Steinwald, Candy Littell, and Laura Dummit--commented on an earlier draft of the study report. Professor Gerard F. Anderson of the Johns Hopkins University also commented on an earlier draft. Carla Pedone, Emily Santer, and Jenifer Wishart made many useful suggestions. Lisa Simonson provided research assistance.

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August 1988





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SUMMARY

In 1983, the Congress changed Medicare's system of paying for inpatient hospital services from a retrospective, cost-based reimbursement system to a prospective payment system (PPS). Under this system, a hospital receives a payment for each patient discharged that reflects the complexity of the case but is not related to its actual operating costs. The Congress believed the new system would alleviate two serious problems caused by Medicare's previous cost-based reimbursement system: inefficiency and lack of budget control. Payments for capital-related expenses, however, were not included in the PPS, and they continued to be paid on a cost basis. This exclusion was based on the concern that--because of the long lives of many investment projects--hospitals might not be able to make the necessary adjustments fast enough to avoid serious financial problems.

CAPITAL COSTS AND THE CAPITAL CYCLE

Capital costs are those recurring expenses for hospitals associated with the use of capital--including interest, depreciation, return on equity, rent, and costs of leasing equipment. These costs represent a continuing flow that should not be confused with a hospital's stock of physical capital--the buildings, plant, land, and equipment--or the financial assets and liabilities of a hospital.

Capital costs are much more apt to vary than operating costs, as a result of what is termed the "capital cycle." Interest expenses are high in the early years after a hospital investment project is completed, but they decline as the principal is repaid. Total capital costs--composed of these declining interest costs and constant depreciation costs--fall over time. Recently completed investment projects are also likely to have much higher capital costs for yet another reason: construction and equipment costs were usually higher at the time the most recent projects were undertaken.



Despite their high variability, inpatient capital costs have only a modest influence on the level and variability of total inpatient costs. In 1984, for example, they represented only 8.6 percent of total inpatient costs.

ADVANTAGES AND DISADVANTAGES OF INCLUDING CAPITAL PAYMENTS IN THE PPS

The current system for reimbursing hospitals for capital costs has several serious problems:

- o Capital-related expenses are not accurately measured, and their correct apportionment to Medicare patients is difficult to determine;
- o Hospitals are not encouraged to be economical in purchasing or leasing capital; and
- o Medicare payments for capital are not under direct federal control.

Incorporating capital costs into the PPS would not solve the first problem: determining the appropriate prospective payment would be just as complicated as estimating capital costs under the current system. Including capital costs in the PPS would, however, respond to the problems of inefficiency and lack of budget control. Since Medicare payments would be based on the number of patients discharged rather than the costs of treatment, any reductions a hospital decides to make in its capital spending would not lower its reimbursement from Medicare. For this reason, hospitals would probably make more efficient use of capital under the PPS. In addition, the Medicare program would be better able to control payments for capital under the PPS. Total payments would grow only to the extent that the PPS rate, total discharges, or case complexity increased.

Because of these advantages, the Congress has indicated its intention to pay prospectively for capital costs in the future. Including capital costs in the PPS would have some disadvantages, however. The most obvious one is that some hospitals might not be able to ad-

just to a system in which payments for capital would not rise and fall with capital costs. Another, less obvious problem is that such a change would reinforce the incentives under the current system to avoid treating certain patients and to discharge patients earlier than medically desirable.

IS A TRANSITION POLICY NEEDED?

Even if most hospitals could eventually adjust to the new system, establishing it immediately might cause some hospitals to receive large percentage windfall gains or losses in reimbursements for capital costs in the short run. These changes would be closely related to whether a hospital was at a low or at a high stage of the capital cost cycle.

Under one illustrative method of including capital costs in the PPS simulated in this study, more than 60 percent of all hospitals would have received higher Medicare payments for capital in 1984 than under the cost-based reimbursement system, assuming their behavior was unchanged. On the other hand, about 25 percent of hospitals would have received at least 20 percent less compared with cost-based reimbursement. If the analysis had assumed that hospitals could have reduced their costs in response to prospective payment, the proportion of losers would have been lower. In fact, because hospitals would have incentives to be more economical in their use of capital under prospective payment, the analysis overstates the losses and understates the gains. A system that was designed to be budget neutral, for example, might actually increase the average profit margins of hospitals compared with cost-based reimbursement because of the behavioral responses.

How, then, do the potential disruptions of including capital in the PPS compare with those that were projected under the PPS for operating costs? To answer this question, the Congressional Budget Office (CBO) compared the change in reimbursement that would have resulted from including capital costs in the PPS with the change that would have been caused by immediately paying prospectively for operating costs in 1984. In both cases, it was assumed that hospitals did not change their behavior. The change in payments for capital

costs, absolutely or as a percentage of total Medicare payments, would generally have been smaller than the corresponding change in payments for operating costs. For example, only one hospital in thirteen would have had changes in payments for capital greater than \$200 per discharge compared with two out of three hospitals that would have had changes in payments for operating costs at least that large.

OPTIONS FOR TRANSITION TO PPS

Transition policies attempt to provide relief for at least some of the hospitals that would receive less if capital payments were included in the PPS immediately. Such policies present a trade-off between equity and efficiency. Although financial problems would be eased for some hospitals, the incentives for more economic behavior would be reduced as well. Three transition options are analyzed in this study:

- o *Blend Prospective Amounts with Hospital-Specific Costs.* This transition policy--patterned after the transition for operating costs under PPS--would base payments for capital costs to each hospital on a weighted average of the PPS rate for capital and each hospital's actual costs in a base period. The proportion of the payment based on hospital-specific amounts would decline each year, and the proportion based on the PPS rate would rise, until the payment for capital was fully prospective.
- o *Pay More for Exceptionally High Costs--That Is, for "Outliers."* Such a policy would concentrate on providing relief to hospitals with the highest capital costs. Only hospitals with capital costs above some threshold amount would receive outlier payments.
- o *"Grandfather" Existing Capital.* Under this policy, cost-based reimbursement would be continued for capital in place before a specific date. Capital projects finished after that date would be reimbursed under the PPS.

These transition policies could be designed so that Medicare's total payments for capital costs would be the same as, higher than, or lower than under cost-based reimbursement. Similarly, payments for capital could be reduced or increased without a transition policy. This study compares various transition policies, cost-based reimbursement, and immediate establishment of prospective payment. At the same time, it holds the level of spending constant--in other words, by imposing budget neutrality. Most of the following discussion is based on this convenient assumption.

COMPARING TRANSITION OPTIONS

Each of the three transition options has distinct advantages and disadvantages. For example, blending would have several appealing features. The proportion of payments determined by cost-based reimbursement would be higher in the earlier years before the hospitals had time to adjust and lower in later years. Blending--having been part of the PPS for operating costs--would be easy for hospital administrators and the intermediaries who pay hospitals on behalf of Medicare to understand.

On the other hand, blending would provide relief to many hospitals whose losses under PPS would be quite small. Other hospitals with very high capital costs would receive only partial relief, especially in later years. Depending on the length of the transition, relief might also be provided to hospitals that began expensive capital projects years after 1983, when the Congress stated its intent to pay for capital on a prospective basis.

Outlier payments, restricted to the hospitals with the highest costs, would have the advantage that most hospitals would move to fully prospective payment immediately. Thus, the advantages of greater efficiency would be achieved immediately for most hospitals. Furthermore, relief to hospitals with the highest costs would be much larger--especially in later years--compared with a budget-neutral blending policy.

One disadvantage of outlier policies--especially generous ones that would last many years--is that hospitals with the highest costs would have weaker incentives to look for ways to reduce capital costs than they would have under blending policies. Outlier payments would also raise an equity issue: should relief from PPS be concentrated on hospitals with the highest costs when some of them are probably the least efficient in the industry?

Grandfather policies are appealing because they would limit relief from PPS to those hospitals whose capital costs are based on previous commitments. After completing a major capital project, hospitals may find it difficult to alter their capital costs for many years. Hospitals contemplating further expansions or renovations would do so after considering the effects of prospective payment for capital.

The chief disadvantage of carrying out a grandfather policy would be the arbitrariness of any specific cutoff date. Because of the length of hospital planning cycles, hospitals may not complete projects for many years after the commitment is made. No matter what the cutoff date, some hospitals would receive very different capital payments compared with other, almost identical hospitals.

CHAPTER I

CAPITAL AND MEDICARE'S

REIMBURSEMENT FOR CAPITAL COSTS

Medicare's prospective payment system (PPS)--established in October 1983 by Public Law 98-21--provides a system of payments that are not related to actual hospital operating costs. Instead, a hospital receives a payment for each patient discharged that reflects the complexity of the case. If this payment is lower than actual costs, the hospital must absorb the loss; if the payment is higher, the hospital is allowed to keep the difference. (See the appendix for a more complete discussion of the Medicare PPS. For specific definitions of terms used in this report, see the glossary.)

The Congress enacted the PPS to alleviate two serious problems caused by Medicare's previous cost-based reimbursement system:

- o *Inefficiency.* The incentives for hospitals to reduce costs were not strong since their revenues were, in fact, determined by costs. The more a hospital spent, the more it received from the Medicare program. On the other hand, if a hospital succeeded in reducing its costs, its Medicare payments were cut.
- o *Lack of Budget Control.* The federal government had no control over how much was paid for services delivered to Medicare patients. In essence, by deciding how much to spend, the individual hospital determined how much it would be paid by Medicare.

When the PPS was enacted, however, the lump-sum PPS payment did not include certain costs--in particular, those relating to capital (for example, the use of capital facilities and equipment, including depreciation and interest expenses). These costs continued to be paid under the old cost-based reimbursement system.



Capital was excluded from the Medicare PPS based on two perceptions:

- o The large variation in capital costs among hospitals would require some of them to make a larger adjustment than what would be needed for operating costs; and
- o Hospitals might not be able to make the necessary adjustments fast enough to avoid serious financial problems.

On the other hand, the Congress has repeatedly stated its intention to incorporate capital costs into the PPS. Doing so has two goals--to develop incentives for hospitals to be economical in their use of capital funds and to reduce the growth rate of Medicare's outlays for capital. Neither of these effects is certain, of course, since both depend on the way capital costs would be paid.

Because payments for capital under an expanded PPS would not necessarily match actual capital-related expenses, it might affect the ability of some hospitals to support their capital needs, while providing others with substantially greater reimbursement than their actual costs warranted. Moreover, reducing payments for capital could result in some hospital foreclosures or lower the quality of care for some Medicare beneficiaries. Although the hospital industry has expanded vigorously since World War II, its growth has slowed in recent years, and the number of hospital closings has increased (see Box 1). One important issue to be resolved in designing a new payment system for capital would be how to move from the cost-based one to a system that pays prospectively, without creating serious problems for certain hospitals and beneficiaries, and that has as little adverse effect as possible on the federal budget deficit during the transition period.

CAPITAL, CAPITAL COSTS, AND THE CAPITAL CYCLE

A hospital's capital is a term used broadly to refer to both the physical (durable) assets of a hospital, including the buildings, plant, land, and equipment. Capital costs are those recurring costs associated with the use of capital--including interest, depreciation, return on equity, taxes, insurance, rent, and costs of leasing.

The difference between capital and capital costs is a distinction between a stock and a flow. Capital refers to the stock of land, buildings, and equipment. Capital costs refer to the flow of costs associated with the use of the capital stock. Yet another concept--capital expenditure or investment--refers to a change in the capital stock.

The Nature of Capital Costs

The nature of capital costs is illustrated by the following example. Consider an established hospital that is buying a large piece of equipment--for example, a magnetic resonance imager (MRI) that costs \$1 million and is expected to have a 10-year useful life span. If the hospital were to borrow \$1 million for 10 years at an interest rate of 10 percent to purchase the MRI, the annual loan repayment would be \$162,745 (see Table 1). During the first year, the payment would consist of \$100,000 in interest and \$62,745 in principal. The interest payments would decline each year, reaching \$14,795 in the tenth year; at the same time, the contribution to principal would rise each year until it reached \$147,950 in the tenth year when the loan would be fully repaid. Interest costs would average \$62,745 over the 10-year period.

If the MRI did not wear out or become obsolete, the interest costs would be the only costs of owning the machine. Since the machine has an expected useful life of 10 years, the \$1 million must be included as an additional capital cost. A common convention for depreciation accounting--the straight-line method--is to distribute the costs evenly across the useful life of the asset. For the MRI, this method would result in annual depreciation costs of \$100,000.

If the MRI were financed this way, for the first year the total capital costs would be \$200,000 for interest payments and depreciation; they would, however, be less in each successive year, reaching \$114,795 in the tenth year. The average annual capital costs would be \$162,745, which is identical to the constant annual loan repayment amount (see Table 1).

Capital costs are not the same as cash outlays, however. In the example where the hospital borrows to finance the MRI, the interest and

BOX 1 THE HOSPITAL INDUSTRY SINCE 1946

During the post-World War II period, the hospital industry underwent steady and vigorous expansion. Recently, however, this trend appears to have ended, and given this changing environment hospitals are now confronting uncertainty about future developments. But whether hospitals are really entering a new era or just experiencing a period of temporary turbulence is still too early to determine.

THE POST-WAR EXPANSION

Increases in the number of hospitals, their output, and the intensity of care they provide reflect the general expansion of the hospital industry (see the adjacent figures). For example, the number of hospitals grew 35 percent from 4,444 in 1946 to a high of 5,979 in 1975, the number of beds per capita increased by 32 percent between 1946 and 1977, and hospital admissions per capita rose 64 percent between 1946 and 1980.

The intensity of care in hospitals--as measured by full-time equivalent (FTE) staff per bed, payroll per admission, and expenses per admission--continued to soar through 1986, the most recent year for which data are available. Since 1946, FTEs per bed grew by 189 percent, payroll per admission (in 1986 dollars) increased 676 percent, and expenses per admission rose more than 804 percent.

Occupancy rate and the average length of stay (ALOS) had more erratic patterns of change. Between 1946 and 1983, occupancy rates hovered between 72 percent and 79 percent. ALOS also fell and rose, but overall it declined from a high of 9.1 days per admission in 1946 to 7.1 days per admission in 1986.

These trends have been affected by three major forces:

Private Hospital Insurance. Increased coverage for hospital expenses by private health insurance has led to a greater demand for a broader range of medical services. Private hospital insurance covered less than 10 percent of the population in 1940, but about 80 percent in 1975.

Government Programs. Federal legislation has increased both the supply of and demand for hospital services. Hospital expansion was subsidized by programs such as Hill-Burton (Public Law 79-725), which provided direct support for the construction of hospitals. Moreover, with the passage of Medicare and Medicaid in 1965, demand for hospital services, particularly by the elderly and those with the lowest incomes, increased.

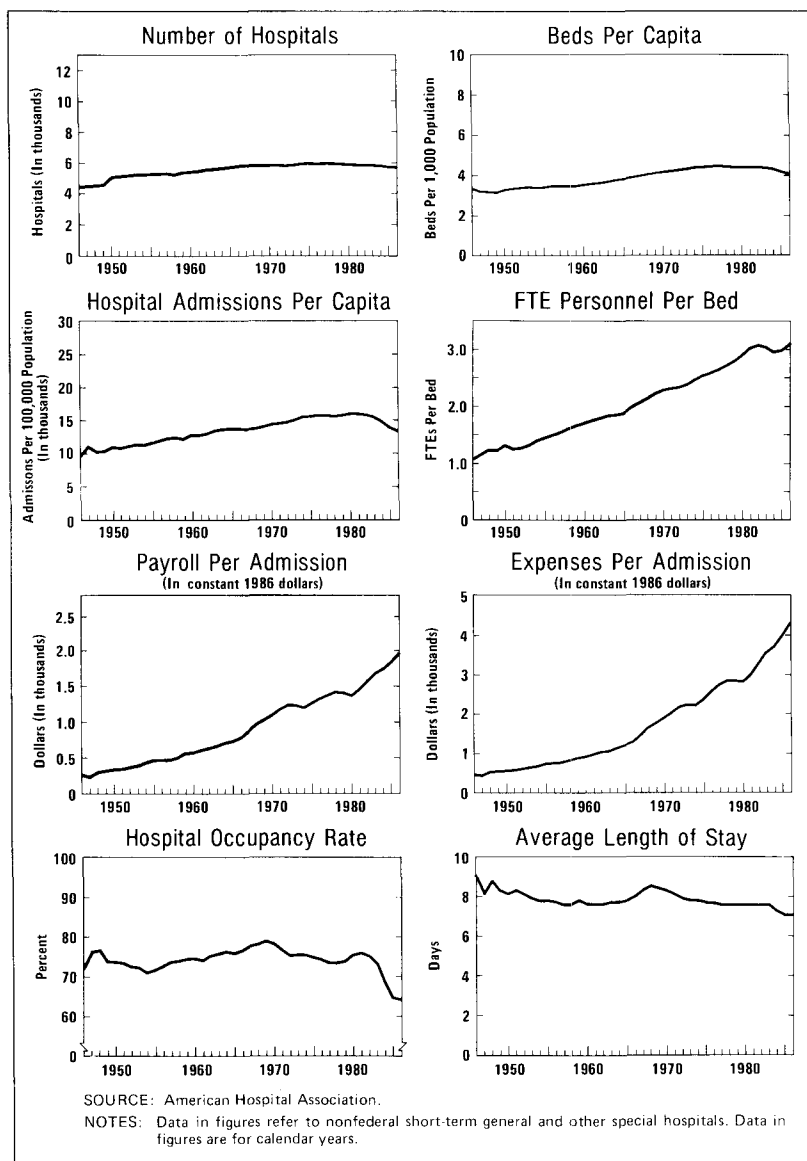
Technological Change. A surge in technological advancements has led to shorter, but more intensive hospital stays. New techniques frequently require more highly trained staff--and more of them--as well as greater use of other resources per admission.

RECENT FLUCTUATIONS

The historical pattern of general growth in the hospital industry, however, does not apply to the recent period in which the intensity of care continued to grow, but hospital use declined. FTE per bed, payroll per admission, and expenses per admission reached their highest levels in 1986. At the same time, the number of hospitals, beds per capita, and admissions per capita have all declined, while occupancy rates and ALOS are both at a post-war low.

Hospitals face still another new situation. Cutbacks in government funding and cost controls imposed by private-sector payers limit resources for health services. Health maintenance organizations and other alternative delivery systems--which are thought to reduce hospital admissions per capita--are growing rapidly.

Under these conditions, some hospitals are closing. The American Hospital Association reported a record of 79 community hospital closings in 1987 and attributed this outcome to an unstable economic environment. Yet, expenses per admission continue to rise as hospitals try to raise their patient load by offering physicians the benefits of additional services, new technology, and better staffing in the face of declining demand for hospital care.



depreciation costs of \$200,000 would be considerably higher than the cash outlays of \$162,745 in the first year, while the reverse would be true in later years. For example, in the tenth year the interest and depreciation costs of \$114,795 would be considerably less than the cash outlays of \$162,745.

Suppose, instead, that the hospital had enough assets to finance the MRI without borrowing. In that case, the hospital would lose the amount it could have earned on the investments that would be liquidated in order to purchase the equipment--10 percent, or \$100,000 during the first year--if the hospital earns the same interest rate as it must pay to borrow. Because the MRI pays for itself over time, the hospital would gradually recoup its liquidated investments and restore its lost interest earnings. These lost interest earnings--known as return on equity--would be equivalent to interest on borrowed funds. Since depreciation is not affected by the way the purchase is financed, the hospital would "pay," on average, \$162,750 annually for the MRI.

TABLE 1. REPAYMENT SCHEDULE FOR A 10-YEAR LOAN (In dollars)

Year	Total Payment	Interest	Principal
1	162,745	100,000	62,745
2	162,745	93,725	69,020
3	162,745	86,823	75,922
4	162,745	79,231	83,514
5	162,745	70,880	91,866
6	162,745	61,693	101,052
7	162,745	51,588	111,157
8	162,745	40,472	122,273
9	162,745	28,245	134,500
10	162,745	14,795	147,950
10-Year Average	162,745	62,745	100,000

SOURCE: Congressional Budget Office calculations based on \$1 million loan at 10 percent annual rate of interest.

Finally, consider the case in which the hospital leased or rented the MRI. In this example, the leasing company would charge an annual fee--such as \$162,750--from which it would pay interest and depreciation. Even though the hospital would not own the capital good--the MRI--its capital costs would not be very different.

Most often, hospitals face more complex choices than those in the above example. For one thing, the costs of borrowing, owning, and leasing are not usually identical. For instance, the typical hospital must pay a higher interest rate when it borrows compared with the highest rate that it can earn on savings. The costs of for-profit hospitals are further influenced by provisions of the tax code--for instance, borrowing, owning, and leasing have distinct tax effects. Furthermore, loans and bond issues may be arranged with a wide assortment of repayment schemes with related differences in interest costs. The fact remains, however, that the use of a piece of capital equipment entails average annual costs of roughly the same magnitude no matter how those services are obtained, although the cash payments in any year may vary considerably.

A final note on this topic: the concept of capital costs in this study is based on accounting convention rather than economic theory. Economists, for example, would base depreciation allowances on replacement instead of historical costs. Medicare, however, bases its reimbursement on historical costs, following the accounting definition of capital costs.

The Capital Cycle

Capital costs are much more apt to vary--relative to median or average capital costs--than is the case for operating costs. On the other hand, capital costs are a much smaller share of total costs compared with operating costs.

Hospitals' Costs in 1984. Data from the 1984 Medicare cost report show that average hospital inpatient costs per case--the sum of operating and capital costs excluding return on equity--was \$2,631 (see Table 2). Operating costs with a median of \$2,395 accounted for 91.4 percent of inpatient costs. Capital costs with a median of \$195 per

Comparatively few hospitals had capital costs near the median; only one in four had capital costs within 25 percent of the median. In fact, for one out of 10 hospitals, capital costs in 1984 were at least \$586, or 300 percent of the median.

The Capital Cycle. This higher variability of capital costs compared with operating costs can be explained in part by what is termed the "capital cycle." Total capital costs vary in a predictable pattern throughout the useful life of capital goods. During the early years, a mortgage payment consists of high interest costs and a small repayment of principal (which incidentally, unlike depreciation, is not a cost of capital). The interest costs decline and repayment of principal increases each year until the mortgage is paid off. Since interest is a cost and repayment of principal is not, this type of capital cost decreases each year. In contrast, under straight-line accounting methods, depreciation is constant over the useful life of the asset. As a result, total capital costs also decline over time if the capital acquisition is financed by borrowing.

This relationship between an asset's age and capital costs is shown in Figure 2. The *interest* line represents declining interest costs over the years for the same facility. The *depreciation* line represents constant depreciation for a hospital with a facility that cost \$10 million and has a useful life of 20 years--that is, \$500,000 per year. Finally, the *total capital costs* line indicates the sum of interest and depreciation costs for each year since the capital project was completed. The costs decline from \$1.5 million during the first year, to about \$600,000 in the twentieth and final year after the project is completed. Capital costs are zero thereafter.

In addition to experiencing declining interest costs over any particular asset's life, a hospital with older assets probably acquired those assets at much lower costs than the hospital with a new physical plant. For example, if inflation in construction costs averaged 7 percent annually for 20 years, then the same facility that costs \$10 million today would have cost only \$2.6 million 20 years ago. Higher rates of inflation would make the difference even greater.

Figure 3 illustrates how the combination of these two forces--declining interest costs and increasing costs of construction--leads to

Figure 2.
Illustrative Life Cycle of Capital Costs

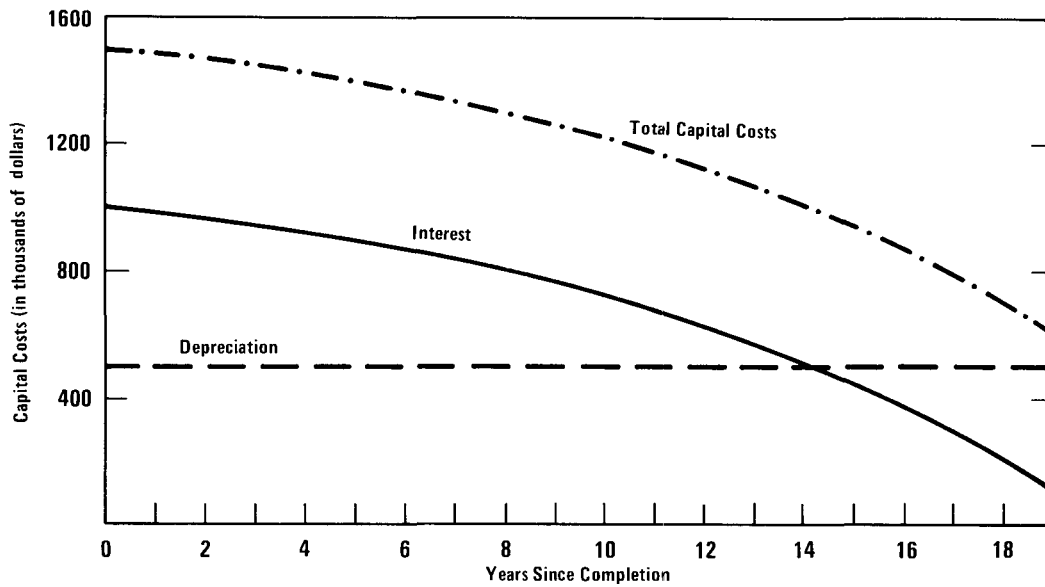
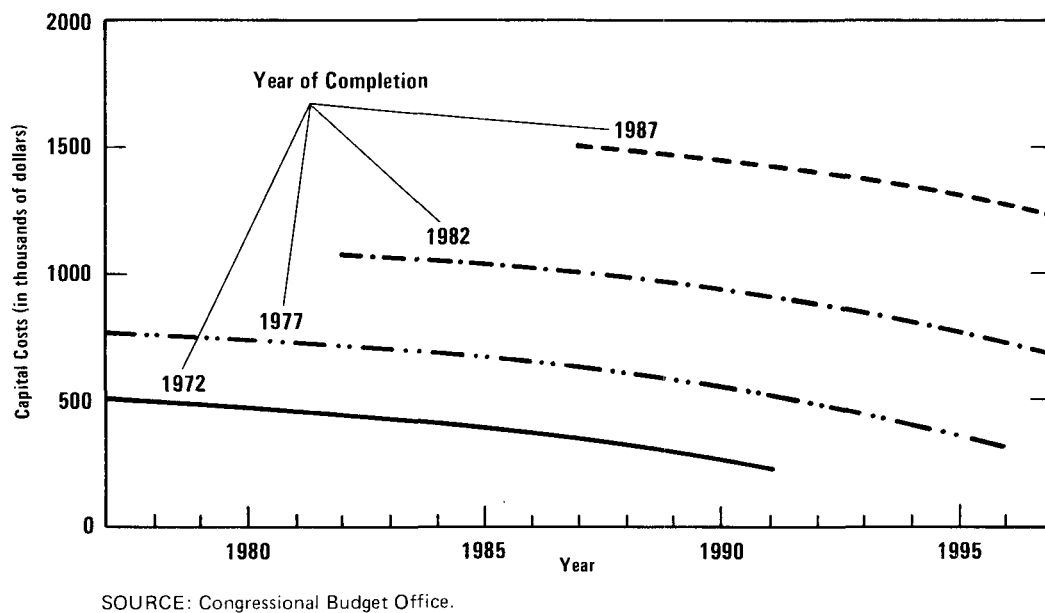


Figure 3.
Illustrative Effect of Increasing Construction Costs
on the Life Cycle of Capital Costs



much higher costs for newer hospitals. The lines labeled 1972, 1977, 1982, and 1987 represent total capital costs for the same type of facility completed in each of those years, assuming that construction costs grow 7 percent annually. Total capital costs during the first year after completion range from \$543,669 for the facility completed in 1972 to \$1.5 million for the one completed in 1987. Although these costs are intended to be illustrative, the pattern is similar for a wide variety of assumptions about useful lives, interest rates, and inflation in construction costs.

The differences among hospitals in total capital costs resulting from their capital cycles are not, however, usually as severe as this simple example suggests. For one thing, hospitals often have a complex combination of facilities--each with a different completion date. Furthermore, movable equipment has a shorter life span than buildings and is constantly being replaced. These two features suggest that the ratio of peak to trough (or high to low) capital costs is not as large as illustrated here.

Other Factors. The capital cycle is not the only source of variation in hospital capital costs. Construction costs, interest rates, and styles of medical practice vary across the country, from hospital to hospital, and from year to year. The presence of the capital cycle, however, implies that capital costs would be expected to vary considerably among similar types of hospitals in the same geographic area.

MEDICARE'S PAYMENT FOR CAPITAL-RELATED COSTS

Medicare reimburses hospitals based on the share of "reasonable" capital-related costs attributable to treating Medicare beneficiaries. Reasonable capital costs are defined to include interest, depreciation, leasing and rental expenses, some taxes and insurance expenses, and return on equity for investor-owned hospitals. Interest and depreciation are the largest capital-related costs; of the other smaller capital costs, return on equity has received more attention from the Congress. Medicare paid 96.5 percent of reasonable costs in 1987, but only 88 percent in 1988 and 85 percent in 1989.